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THE EFFECT OF EDUCATION FOR DAILY PHYSICAL ACTIVITY LEVEL RECOVERY OF OSTEOARTHRITIS PATIENTS AFTER TOTAL KNEE ARTHROPLASTY. A PROSPECTIVE RANDOMIZED CONTROLLED CLINICAL TRIAL USING ACCELEROMETRY

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Purpose: End-stage OA of the knee can cause a remarkable pain, and decrease the physical activity of the patients. Total knee arthroplasty (TKA) is an effective way to relieve pain and increase physical activity. Education is recommended for the management of osteoarthritis. But until now, we don't have any data about the effect of education for daily physical activity level recovery of osteoarthritis after total knee arthroplasty. The aim of this study is to provide an evidence of the effect of education for daily physical activity of osteoarthritis after total knee arthroplasty using accelerometry.

Methods: We enrolled 50 female knee OA patients. The inclusion criteria were: age between 55 and 75; the diagnosis was knee osteoarthritis with the Kellgren/Lawrence grade 4; the body mass index (BMI) was less than 35; affected by the unilateral knee OA undergoing primary knee TKA; living in Beijing. The exclusion criteria were: infectious joint diseases; hip joint disease or ankle joint disease which affected the daily physical activities; co-morbidities such as chronic obstructive pulmonary disease which affected the daily physical activities.

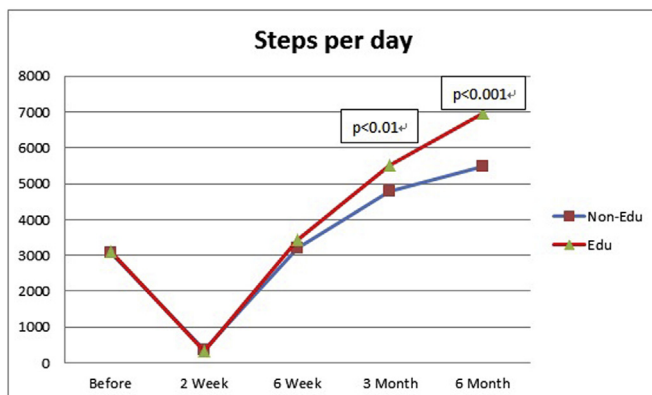
The 50 patients were randomly divided into education group and non-education group. The education group was educated additionally by telephone every month after the TKA surgery. The non-education group was not educated additionally except for visit time. At last 25 patients were in education group, and 25 patients were in non-education group. We visit the 50 patients at the following time point: before surgery, 2 weeks after the surgery, 6 weeks after the surgery, 3 months after the surgery, and 6 months after the surgery.

We used the accelerometer (Fitbit Inc., US) to provide an objective measure of physical activity. At every visit time, the patient was recorded by the accelerometer for a whole week. During every visit time, we also performed the 30-s chair-stand test, 40 m fast-paced walk test, 12 stair-climb test, timed up-and-go test, 6-min walk test to evaluate the physical ability, used WOMAC score and KSS score to evaluate the function of the knee, used SF-12 to evaluate the life quality, used VAS score to evaluate the pain, and used CASI score to evaluate the satisfaction. We also collected the demographic data and the HSS Knee Surgery Expectation Survey data before surgery.

At last, we compare the data of the two group.

Results: There was a significant difference between the two groups 3 months and 6 months after surgery. (3 months, education group 5507.48±837.74, non-education group 4787.19±1038.15. 6 months, education group 6974.10±1396.10, non-education group 5471.70±1243.75). There was no significant difference between the two groups for other tests except for the 40-m fast paced walk test 3 months and 6 months after surgery.

Conclusions: Education for the osteoarthritis patients after TKA surgery can help to improve the daily physical activity level after surgery, especially 3 months after the surgery. Education cannot help to improve most of the physical function ability and health related quality of life after TKA.



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IMPAIRMENTS IN SINGLE LEG SQUAT PERFORMANCE IN PEOPLE WITH EARLY-ONSET HIP OSTEOARTHRITIS

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Purpose: Intra-articular hip joint pathology is a frequent source of hip and groin symptoms, particularly in young active individuals. We observed that a large proportion of young people undergoing surgery for intra-articular hip pathology demonstrate signs of early hip joint osteoarthritis. While pain and self-reported physical function improve in the first 3-6 months post-hip arthroscopy, symptomatic improvements appear to plateau between 6-12 months, and are worse for those with chondropathy. This is reflected in our findings of impairments in hip strength, range of motion and dynamic balance in those who have undergone hip arthroscopy, 1-2 years after surgery, at a time when patients are generally deemed ready to return to sport. However, it is unknown whether functional performance is also impaired. The aims of this study were to: i) evaluate single leg squat performance 1-2 years after arthroscopy for intra-articular hip pathology, compared to controls and the non-operative limb; and ii) investigate whether single leg squat performance on the operated limb was associated with hip muscle strength.

Methods: 34 participants who were 1-2 years post-hip arthroscopy for intra-articular hip pathology (17 females; mean±SD age 36.7±12.6 years, height 1.8±0.1m, weight 79.6±11.1kg), were recruited from a single orthopaedic surgeon. 11 (32%) participants had evidence of severe chondropathy at arthroscopy (Outerbridge grade III-IV), 17 (50%) had mild chondropathy (grade I-II), and 6 (18%) had no chondropathy (Outerbridge grade 0). 34 sex-matched controls were recruited from the community (17 females; age 33.1±11.9 years, height 1.7±0.1m, weight 72±15.5kg). Participants performed five consecutive single leg squats to 60° knee flexion on both legs. Frontal plane pelvic obliquity, apparent hip adduction and apparent knee valgus were measured from video footage, at positions of single leg stance and maximal squat depth. For the hip arthroscopy group, hand held dynamometry was used to measure peak torques for hip flexion, extension, abduction, adduction, and external and internal rotation, and were normalised for body weight. Repeated measures analysis of variance evaluated differences for each outcome measure between: i) hip arthroscopy and control groups (between-subjects factor); ii) operated and non-operated limbs for the arthroscopy group, and the corresponding (dominant vs. non-dominant) limbs for the matched controls (within-subjects factor); and iii) sexes (between-subjects factor). Spearman's correlations investigated the relationship between peak torques and the change in frontal plane angles from standing to peak squat depth. Significance was set at 0.05.

Results: The hip arthroscopy group demonstrated significantly greater apparent hip adduction (mean difference 2.7°, 95% CI 0.7° to 4.8°) and apparent knee valgus (4.0°, 1.0° to 7.1°) at peak squat depth, compared to controls. The operated limb also demonstrated significantly greater pelvic obliquity during single leg stance compared to the non-operated limb (1.2°, 0.1° to 2.3°). Women had significantly greater apparent hip adduction (standing 1.6°, 0.5° to 2.6°; peak squat depth 2.4°, 0.3° to 4.4°) and apparent knee valgus (standing 3.3°, 1.8° to 4.7°; peak squat depth 3.1°, 0° to 6.1°) than men. Significant moderate positive correlations were found for change in pelvic obliquity with hip flexion peak torque ($\rho=0.341$), change in apparent hip adduction with hip flexion ($\rho=0.496$) and extension peak torque ($\rho=0.482$), and change in apparent knee valgus with hip flexion ($\rho=0.391$) and extension peak torque ($\rho=0.417$) ($p<0.05$).

Conclusions: Deficits in single leg squat performance are present in people with chondropathy 1-2 years after hip arthroscopy. Moderate correlations between greater strength of prime movers and greater excursion of frontal plane angles suggest compensatory movement strategies to improve hip control during single leg tasks. The altered movement patterns observed have the potential to increase hip joint impingement, and increase loading on vulnerable intra-articular structures, such as the acetabular labrum and anterosuperior chondral surface. This may have important implications for continuation of symptoms and the development and progression of degenerative hip joint disease, especially in younger active adults.